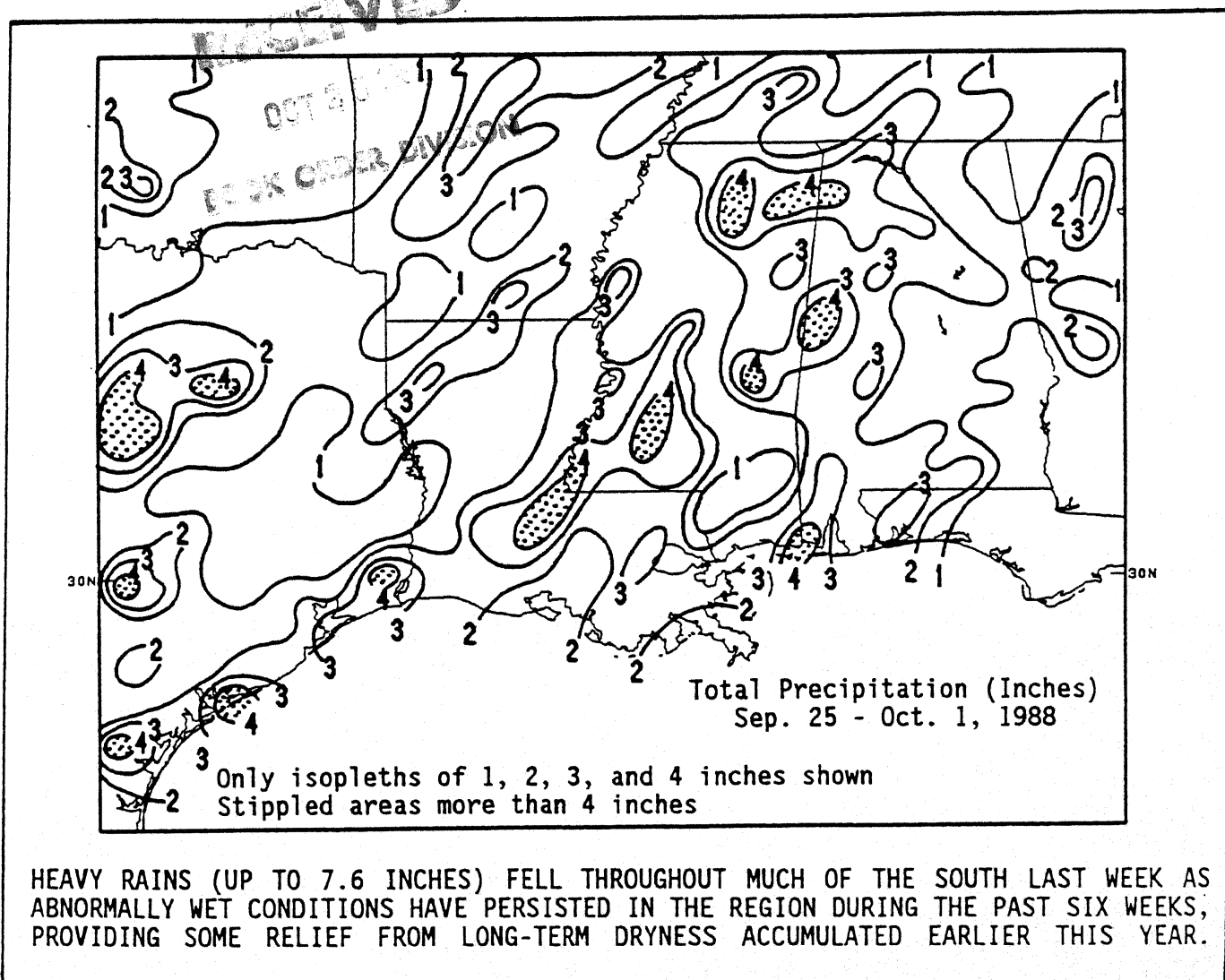


# WEEKLY CLIMATE BULLETIN

No. 88/40

Washington, DC

October 1, 1988



**UNITED STATES DEPARTMENT OF COMMERCE**  
**NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)**  
**NATIONAL WEATHER SERVICE - NATIONAL METEOROLOGICAL CENTER**

## WEEKLY CLIMATE BULLETIN

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This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief, concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major global climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every 3 months).
- Global temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Center via the Global Telecommunication System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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# GLOBAL HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF OCTOBER 1, 1988  
(Approximate duration of anomalies is in brackets.)

## 1. North Central United States:

DRYNESS CONTINUES TO EASE.

Short-term dryness in the northern Great Plains and Rockies continues to diminish; however, long-term precipitation deficits remain as the area enters its normally dry season. See U.S. Weekly Weather Highlights [29 weeks].

## 2. Brazil, Bolivia, and Paraguay:

BELOW NORMAL PRECIPITATION PERSISTS

Less than 13 mm (0.51 inches) of precipitation was reported in southern Brazil, Paraguay, and northeastern Argentina as the normally wet spring season commences [14 weeks].

## 3. Colombia:

HEAVY RAINS CAUSE FLOODING

Up to 115.1 mm (4.53 inches) of rain fell on parts of western Colombia and caused some flooding during what should normally be the dry season [Episodal Event].

## 4. China and Taiwan:

ABNORMALLY WET CONDITIONS CONTINUE

As much as 454.2 mm (17.20 inches) of rain fell at stations in Taiwan, with lesser amounts reported in southern and eastern China [9 weeks].

## 5. Southern Europe:

AREA UNUSUALLY DRY

Generally less than 10 mm (0.25 inches) of precipitation was reported across southern Europe as an area of dryness developed [4 weeks].

## 6. Southern Thailand:

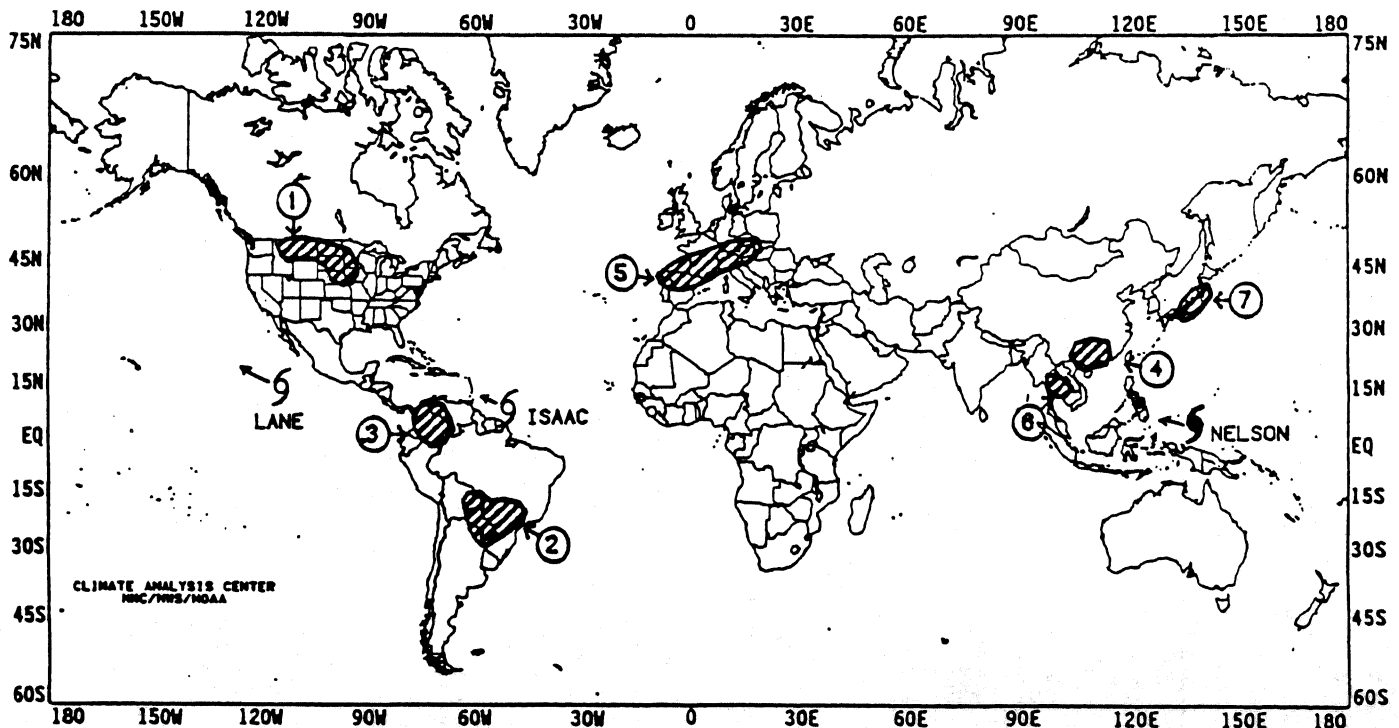
TORRENTIAL RAINS CONTINUE.

Inundating rains, up to 424 mm (16.70 inches), fell for the second consecutive week on parts of southern Thailand [Episodal Event].

## 7. Southern and Western Japan:

WETNESS PREVAILS THROUGHOUT REGION.

Rainfall amounts of up to 315.5 mm (12.42 inches) were reported along the eastern coast of Honshu Island as the area remained anomalously wet [11 weeks].



Approximate locations of the major anomalies and events described above are shown on this map. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, longer term anomalies, and other details.

# U.S. WEEKLY WEATHER HIGHLIGHTS

FOR THE WEEK OF SEPTEMBER 25 THROUGH OCTOBER 1, 1988.

A strong storm system stalled over the nation's midsection last week triggered numerous showers and thunderstorms in the Southeast and the middle Missouri Valley (see Table 1). Heavy rains fell from central Texas eastward to northern Georgia, on eastern Nebraska and western Iowa, on parts of Hawaii, and along the coasts of the Pacific Northwest and southeastern Alaska. According to the River Forecast Centers, the greatest weekly totals in the contiguous U.S. (between 4 and 7 inches) were located in east-central Texas and from south-central Louisiana northeastwards to the northern sections of Mississippi and Alabama (see front cover). This week's ample rainfall, in addition to above normal precipitation during the past four weeks, has significantly diminished long-term deficiencies in most of the Southeast. Light to moderate amounts were observed in the Pacific Northwest, in parts of the northern Rockies, throughout much of the Great Plains, Southeast, and Midwest, and in portions of the mid-Atlantic and northern New England regions. Little or no precipitation was measured in most of the West from central Washington southward to California and eastward to western Texas and central Colorado, in central Montana, the eastern half of the Ohio Valley and much of New England, and in parts of the Carolinas and Virginia.

Temperatures moderated across the majority of the United States last week. In the West, near to slightly above normal temperatures replaced cooler conditions that had persisted in the area the previous two weeks. Farther east, unseasonably warm weather covered most of the Midwest and Southeast as the greatest positive departures (between +5 and +7°F) were concentrated in Iowa, Wisconsin, and Illinois (see Table 2). By the end of the week, however, much cooler air was rapidly advancing southward from Canada into the Great Plains and Midwest. Highs in the eighties occurred at least once last week in the southern two-thirds of the country east of the Rockies and throughout most of the U.S. west of the Rockies, while readings in the nineties were reported in the interiors of Oregon and California, the desert Southwest, and from western Texas eastward to Florida and South Carolina (see Figure 1). Slightly below normal temperatures (departures between -1 and -4°F) prevailed along the coast of southern California, in much of the southern and central Rockies and south-central Great Plains, southern Alaska, and in parts of the mid-Atlantic and northern New England states. Lows slipped below freezing at least once last week in sections of the Great Basin and at stations located in the higher elevations of the northern and central Rockies (see Figure 2).

TABLE 1. Selected stations with more than two inches of precipitation for the week.

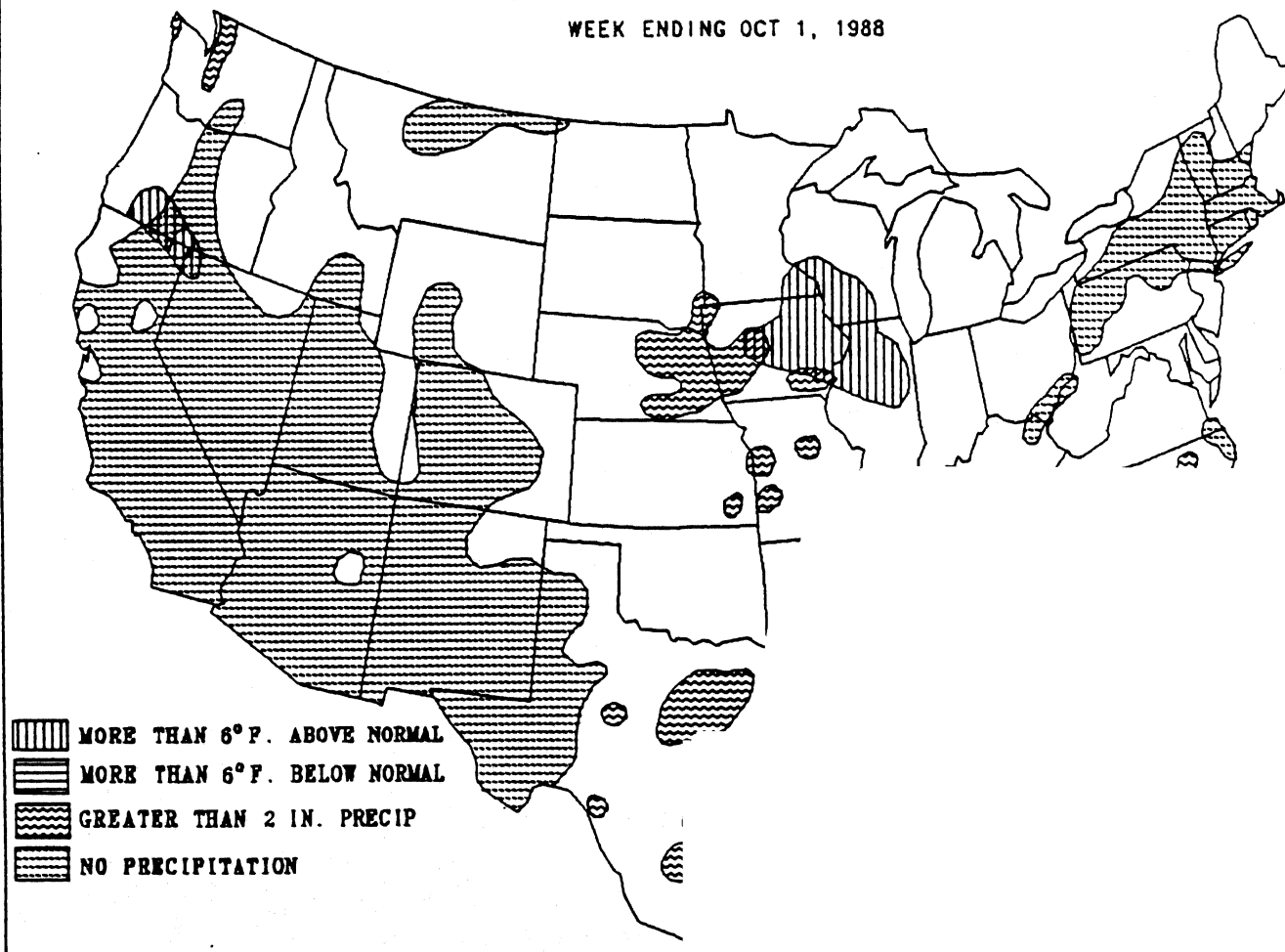
Hilo/Lyman, Hawaii, HI	7.66	Quillayute, WA	2.37
Alice, TX	4.76	Birmingham, AL	2.36
Pensacola, FL	4.64	North Omaha, NE	2.34
Palacios, TX	4.54	Meridian, MS	2.30
Waco, TX	3.96	Tuscaloosa, AL	2.28
Mobile, AL	3.93	Austin/Bergstrom AFB, TX	2.27
Annette Island, AK	3.84	Dallas NAS, TX	2.25
Port Arthur, TX	3.64	Ottumwa, IA	2.23
Beaufort MCAS, SC	3.61	Hopkinsville/Campbell AFB, TN	2.19
Homestead AFB, FL	3.60	Houston/Ellington AFB, TX	2.19
Kodiak, AK	3.59	Jonesboro, AR	2.17
West Plains, MO	3.54	Omaha/Offutt AFB, NE	2.16
Milton/Whiting NAS, FL	3.50	Jackson, TN	2.15
Muscle Shoals, AL	3.43	Norfolk, NE	2.11
Meridian NAS, MS	3.42	Adak, AK	2.09
Jacksonville NAS, FL	3.41	Del Rio/Laughlin AFB, TX	2.08
Jackson, MS	3.13	McComb, MS	2.06
Corpus Christi, TX	2.92	Sioux Falls, SD	2.05
Yakutat, AK	2.45	Dallas/Ft. Worth, TX	2.03

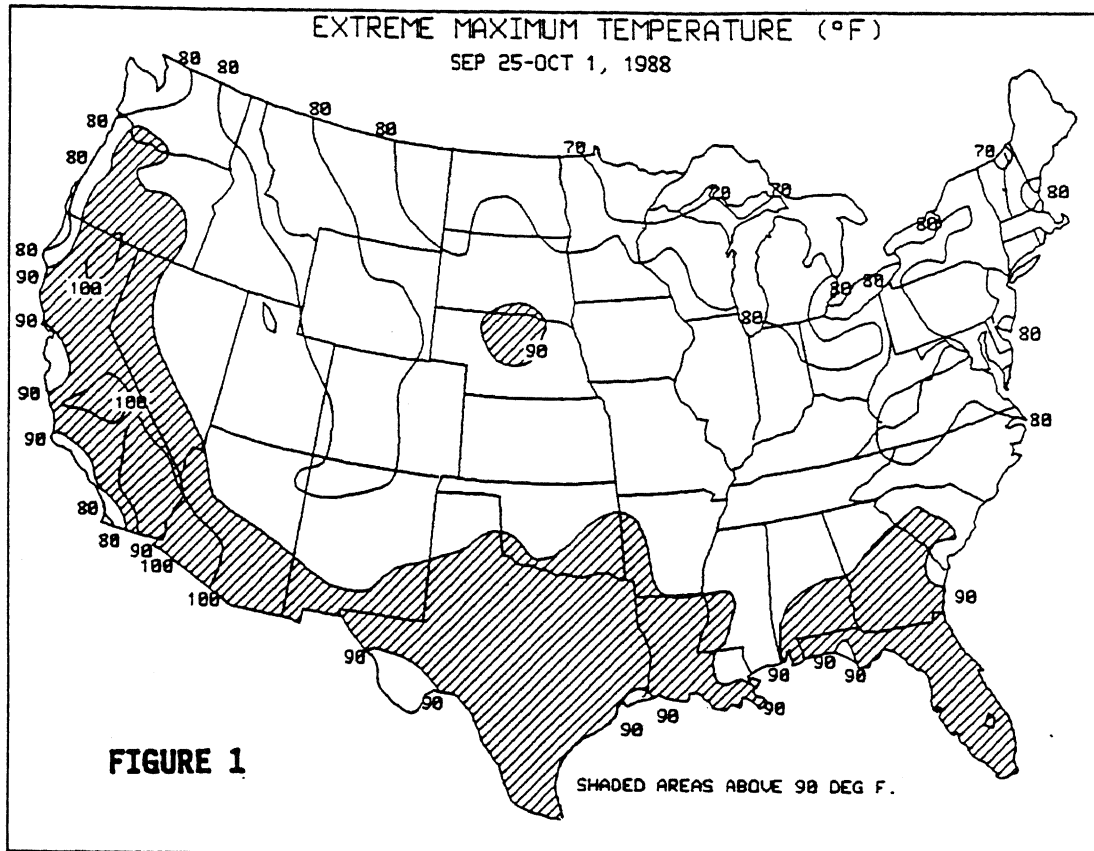
TABLE 2. Selected stations with temperatures averaging greater than 4°F ABOVE normal for the week.

Station	TDepNml	AvgT(°F)	Station	TDepNml	AvgT(°F)
Peoria, IL	+7	68	Columbus, OH	+5	66
Waterloo, IA	+7	64	Chicago/O'Hare, IL	+5	65
La Crosse, WI	+7	64	Des Moines, IA	+5	65
Quincy, IL	+6	68	Findlay, OH	+5	65
Medford, OR	+6	67	Detroit, MI	+5	64
Ottumwa, IA	+6	67	Sioux City, IA	+5	64
Moline, IL	+6	66	Portland, OR	+5	64
Cedar Rapids, IA	+6	66	Milwaukee, WI	+5	63
Rockford, IL	+6	65	Salem, OR	+5	63
Madison, WI	+6	62	Reno, NV	+5	61
Spencer, IA	+6	62	Rochester, MN	+5	60
Mason City, IA	+6	62	Green Bay, WI	+5	60
Phoenix, AZ	+5	85	Eau Claire, WI	+5	59
Valparaiso/Eglin AFB, FL	+5	79	Wausau, WI	+5	58
Victorville/George AFB, CA	+5	73	Worland, WY	+5	58
Indianapolis, IN	+5	67	Cut Bank, MT	+5	54
Burlington, IA	+5	67			

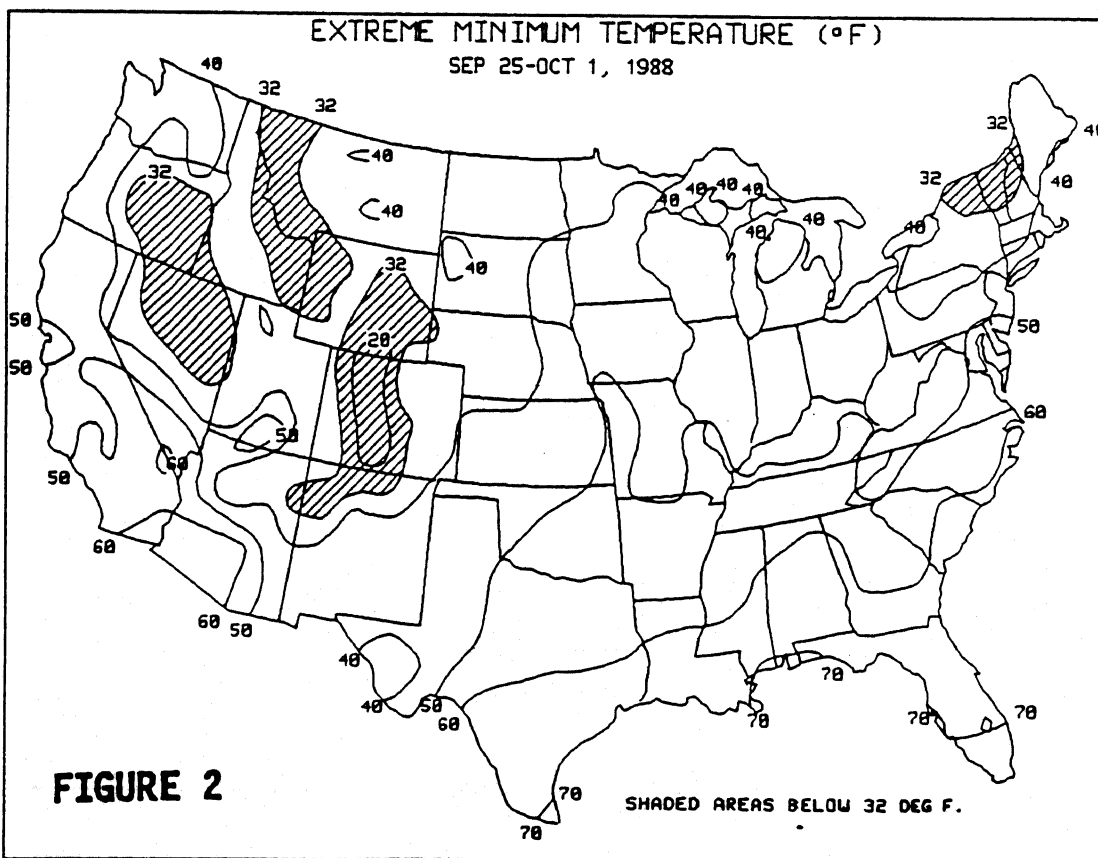
## WEEKLY WEATHER FEATURES

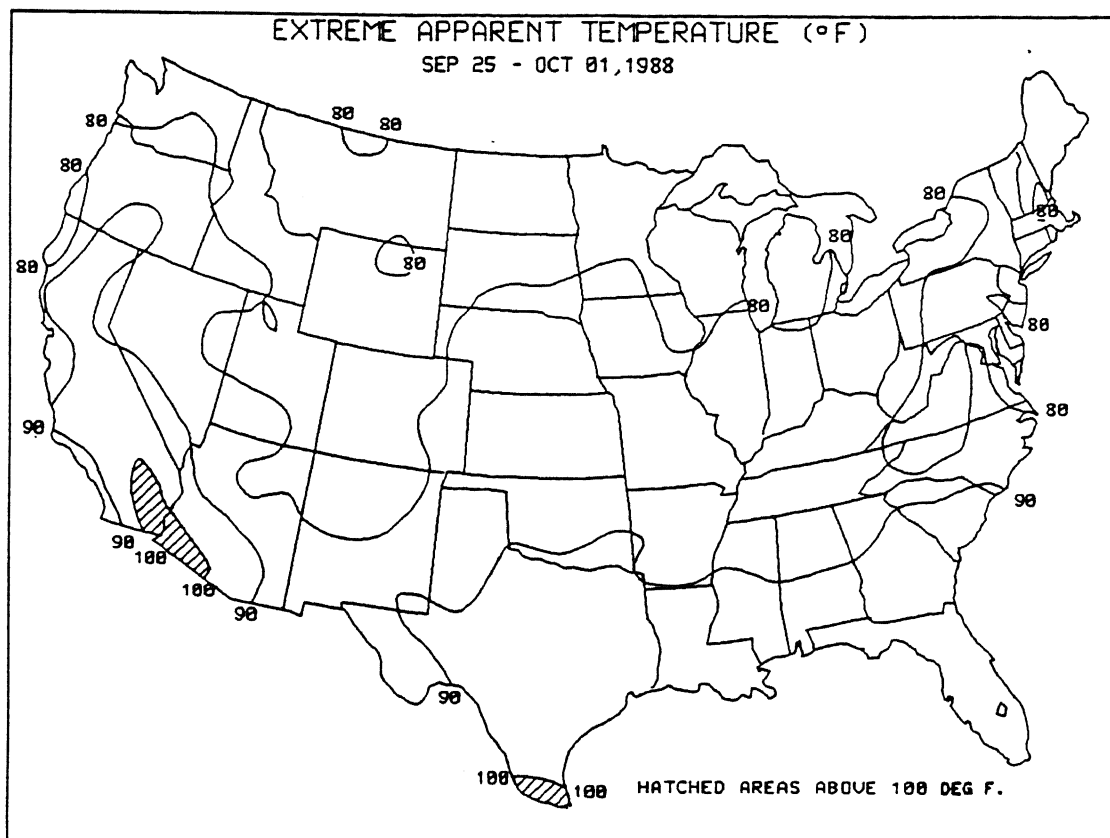
WEEK ENDING OCT 1, 1988





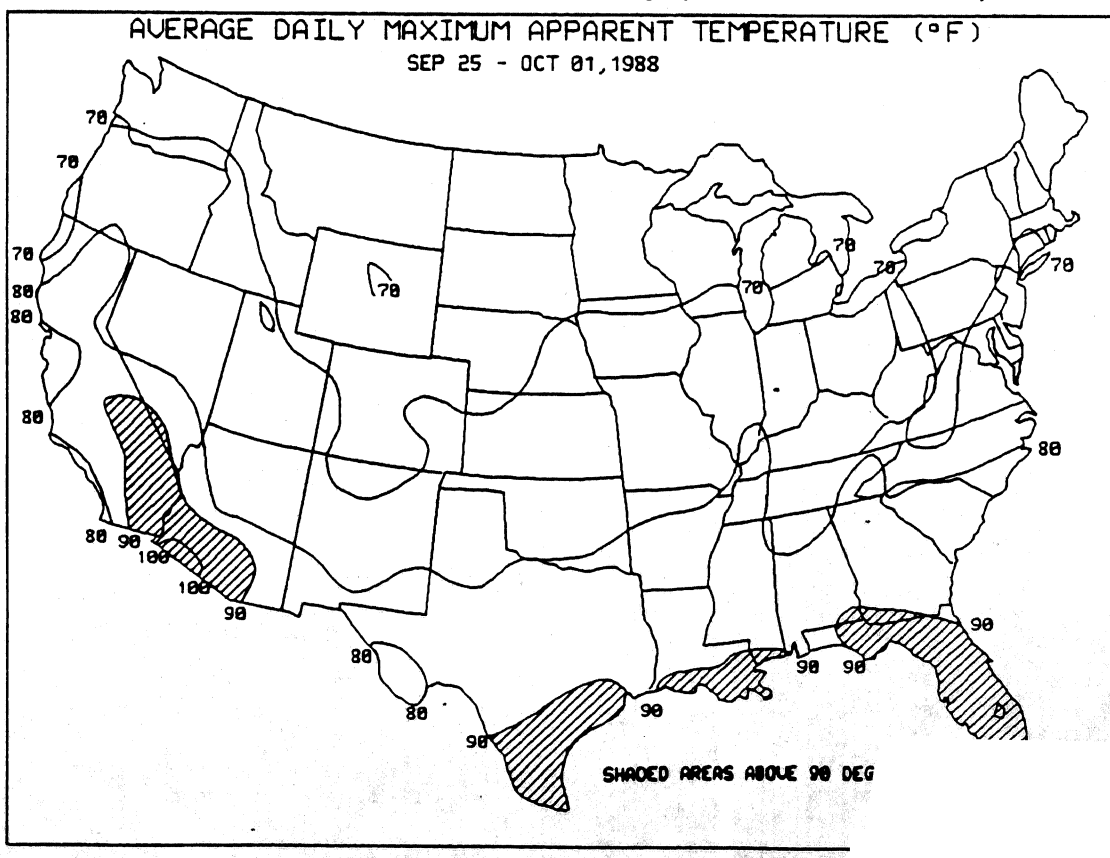
Highs in the nineties occurred at least once last week in the extreme western and southern U.S. while readings in the hundreds were limited to interior California (top); temperatures dipped under freezing in portions of the Great Basin, the northern and central Rockies, and extreme western New England (bottom).

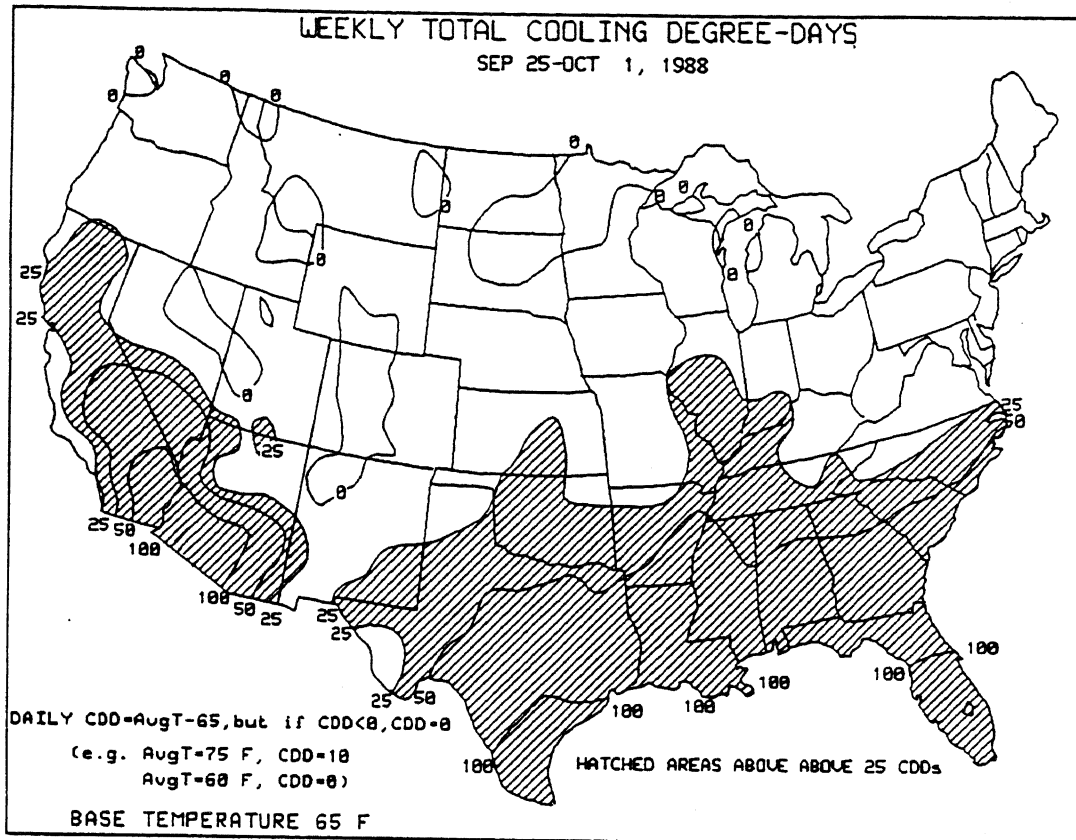




Extreme apparent temperatures only surpassed 100°F in extreme southern Texas and the desert Southwest as seasonably cool weather covered most of the U.S. (top); average daily maximum apparent temperatures were uncomfortable (>90°F) along the Gulf Coast and the desert Southwest (bottom).

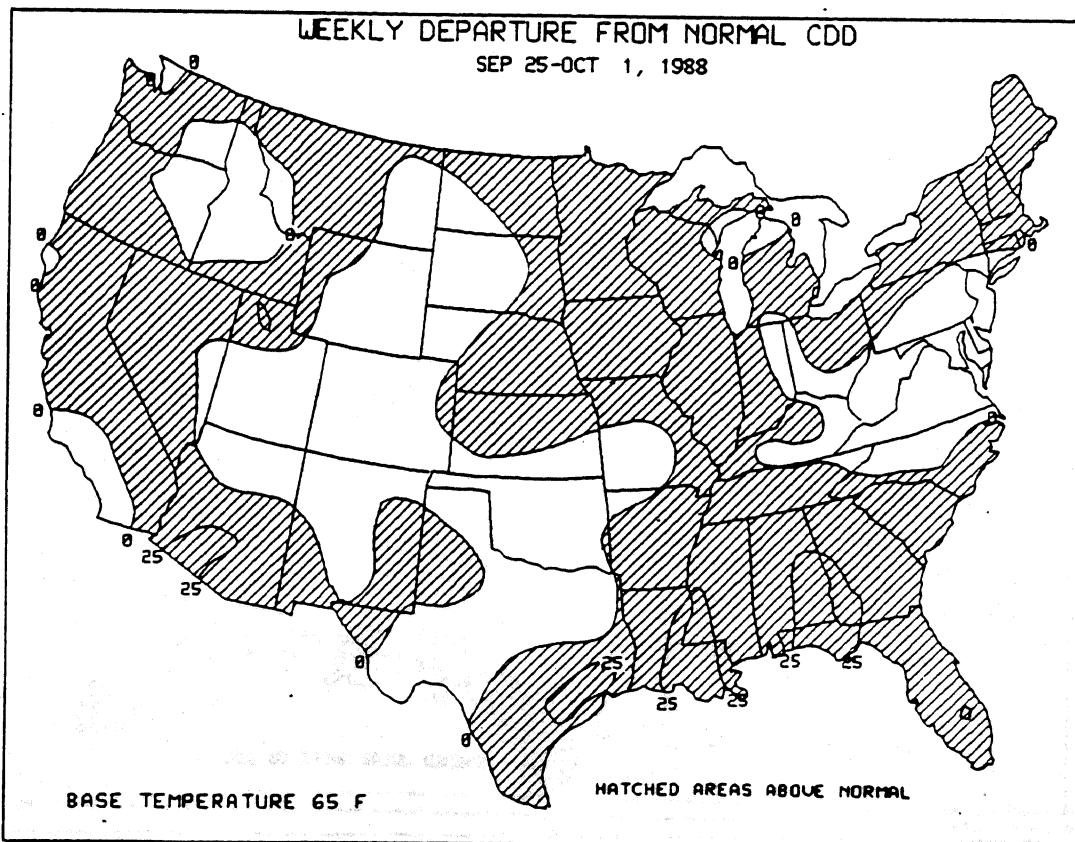
(NOTE: Since October is a transitional month, either the apparent temperature, the wind chill, or both will be shown depending upon the week's weather).





Greatest air-conditioning demand occurred in the South and the desert Southwest (top); weekly CDD demand was abnormally high along the Gulf Coast and in southern Arizona (bottom).

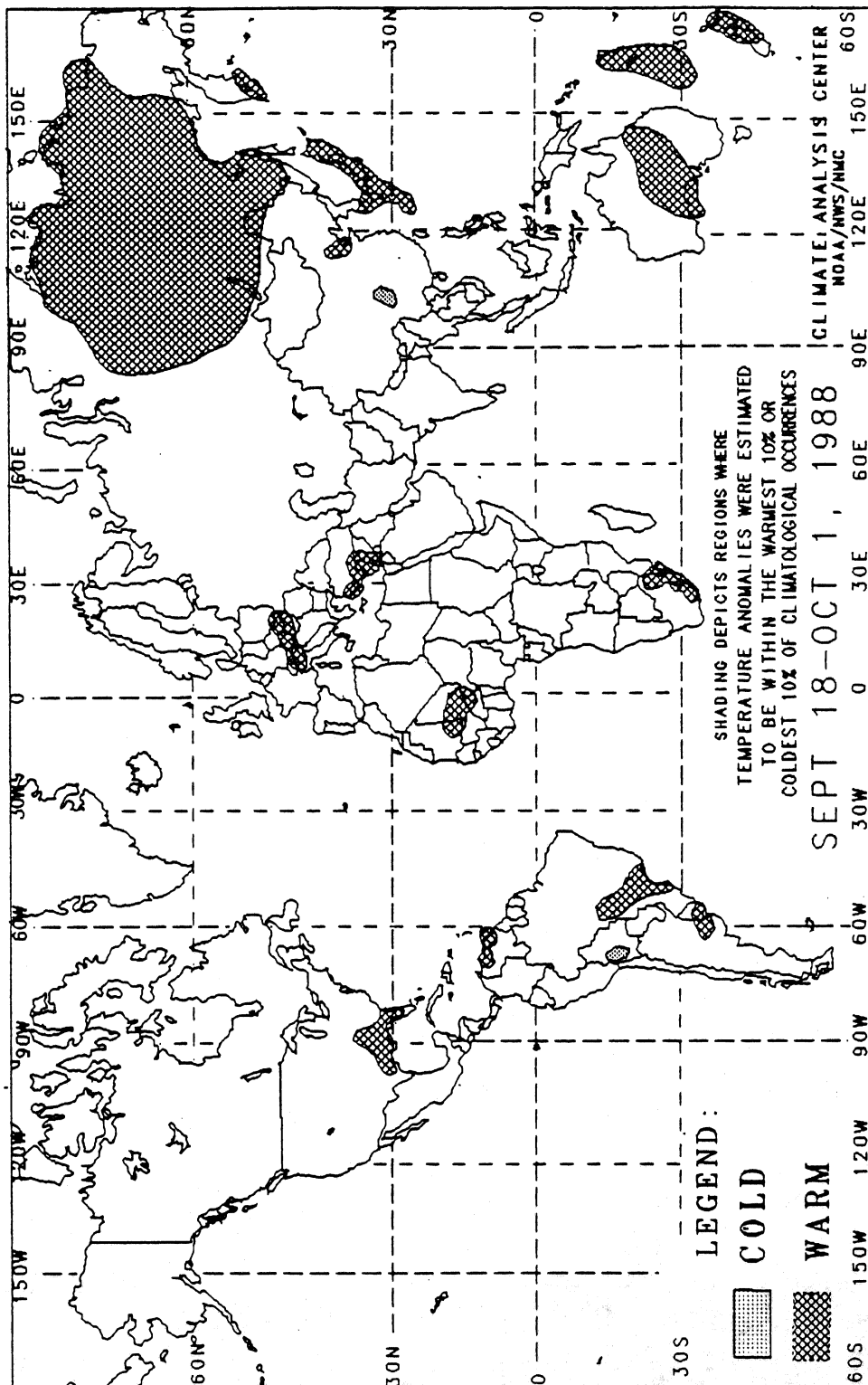
(NOTE: Since October is normally a transitional month from cooling to heating degree days, the week's weather conditions will determine which degree day charts are depicted).





# GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

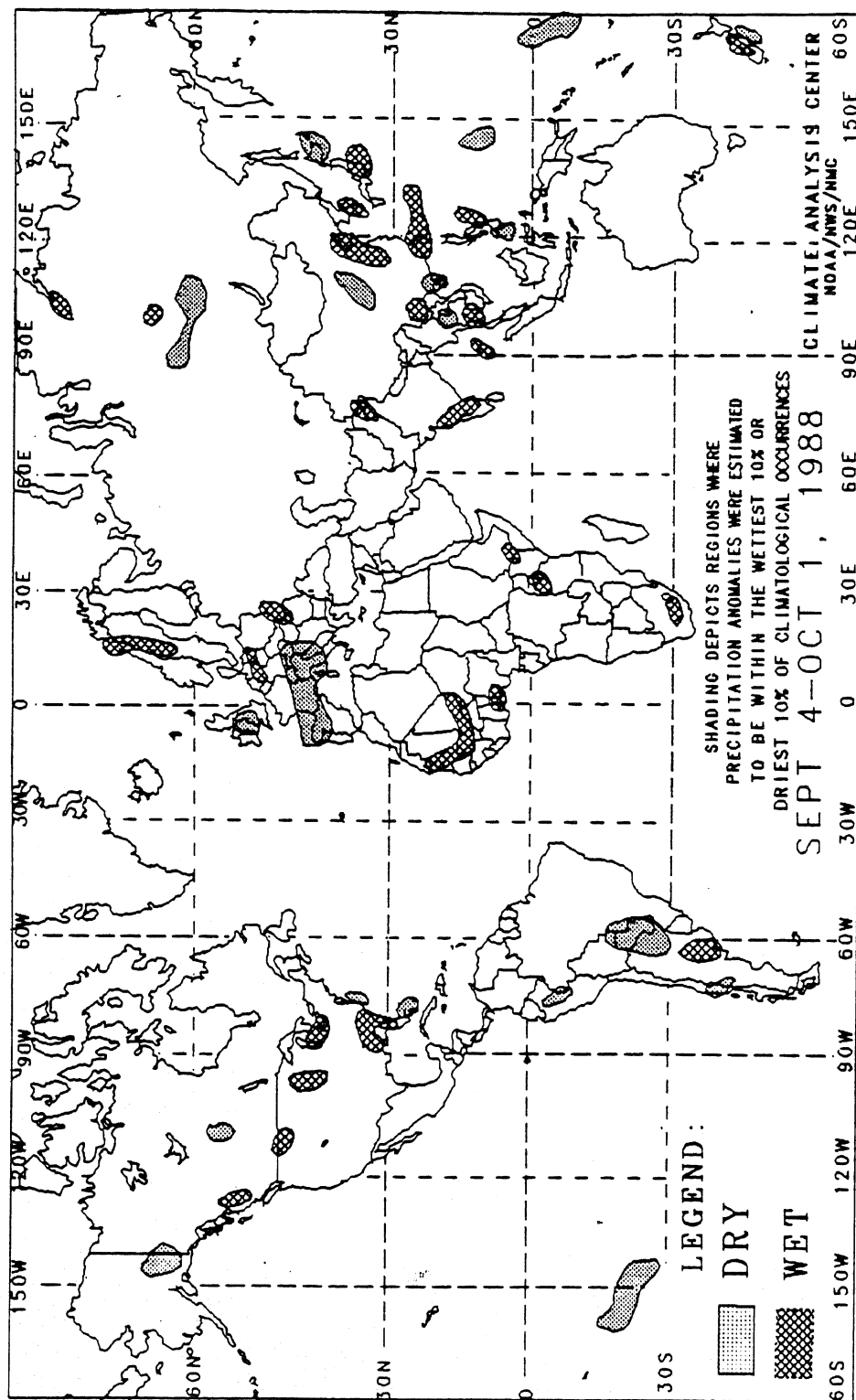
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data is insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

# GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

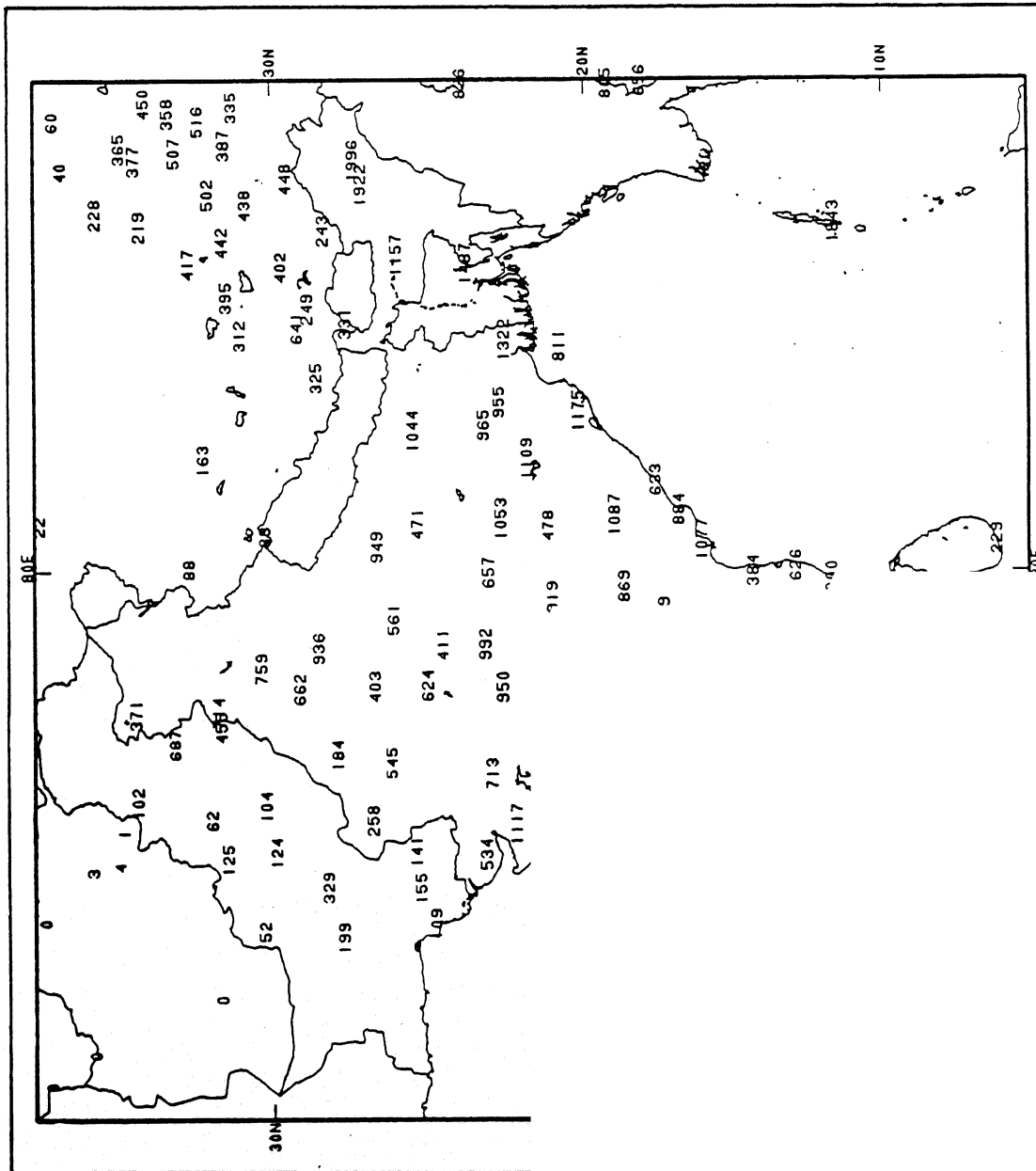
In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data is insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

Climate Analysis Center, NMC

National Weather Service, NOAA

## REVIEW OF THE 1988 INDIAN MONSOON SEASON



June 1-September 30, 1988  
for a station to be  
India, Pakistan, and  
seasonal precipitation,

The first day of October marked the normal end of the 1988 Indian monsoon season (usually from June-September). By October 1, the monsoon has normally withdrawn from Pakistan and northwestern India and is positioned from central Nepal southwestwards to India's Maharashtra state (see Figure 3). Since the last review (see Weekly Climate Bulletin No. 88/34 dated August 20, 1988), most regions in India, Pakistan, and Bangladesh have sustained near to above normal moisture regimes. Unfortunately, torrential downpours in northeastern India's Assam state and in Nepal during September did little to ease, if not worsen, severe downstream flooding throughout Bangladesh. Additionally, heavy rains late in September have produced widespread flooding in both India's and Pakistan's Punjab state according to press reports. However, the ample rainfall during the past six weeks has brought many stations in southern and south-central India from a deficit in July to above normal precipitation for the June-September season.

Since June 1, seasonal totals have ranged from several thousands of millimeters in the normally wet areas of Assam state in northeastern India and along India's western coast, near 1000 mm in central and eastern India, to several hundred millimeters in northwestern India and eastern Pakistan (see Figure 1). Overall, most stations in Pakistan and India (Bangladesh data incomplete and not shown) have measured near to above normal seasonal amounts, especially in Pakistan and northwestern India, where last year's monsoon never became fully established and the area suffered through severe drought. In contrast, parts of central and east-central India, namely Madhya Pradesh, southern Bihar, and southern Uttar Pradesh states, have observed subnormal seasonal precipitation (see Figure 2).

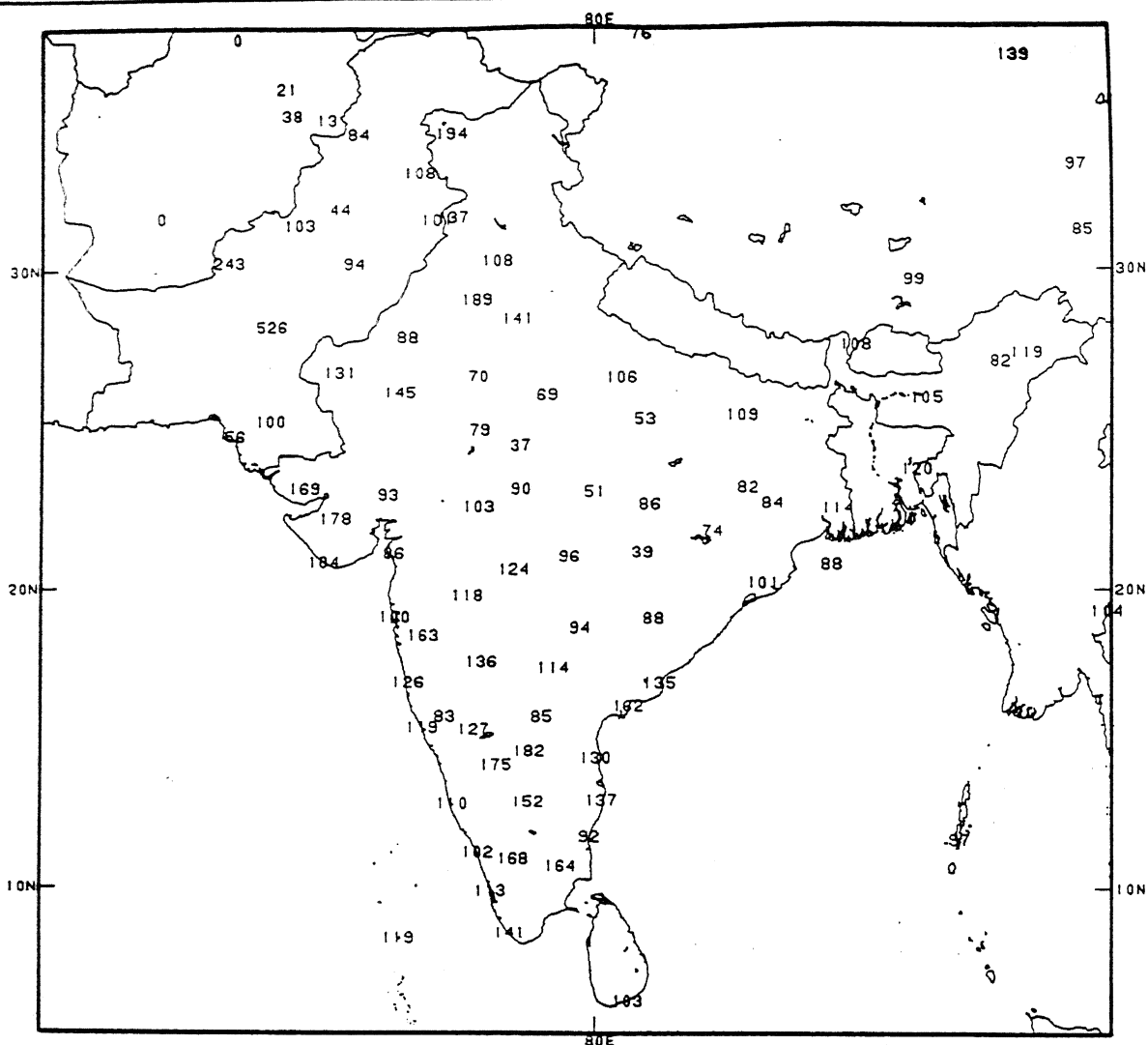
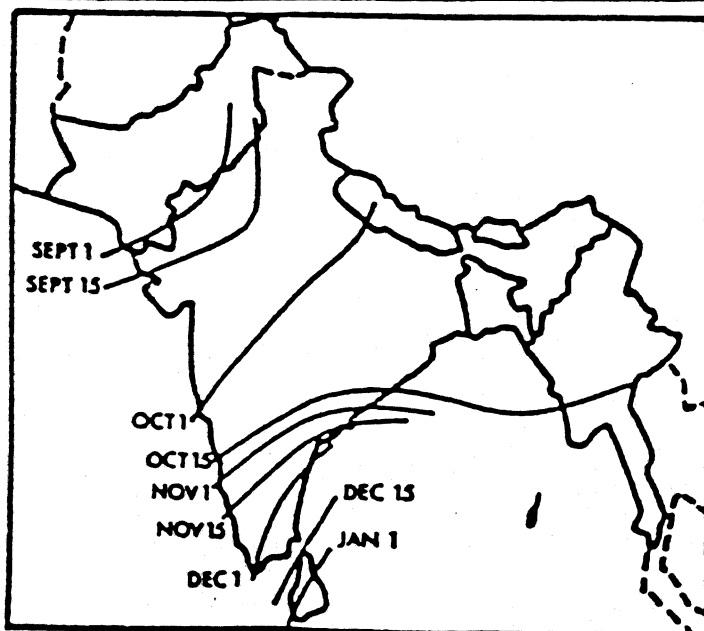


Figure 2. Percent of normal precipitation during June-September, 1988 (122 days). 109 or more days (90%) were required for a station to be included. Except for portions of central and east-central India, much of Pakistan, India, and Bangladesh recorded an unusually wet monsoon season.



**FIGURE 3.**  
Mean date for the  
retreat of the  
Indian monsoon.

# SPECIAL CLIMATE SUMMARY

Climate Analysis Center, NMC  
National Weather Service, NOAA

## REVIEW OF THE 1988 AFRICAN SAHEL RAINY SEASON

Similar to the Indian monsoon season, the African Sahel rainy season normally occurs from June-September. Since the last review (see Weekly Climate Bulletin No. 88/34 dated Aug. 20, 1988), light to moderate precipitation has been observed at most stations in the Sahel, while some areas of Senegal, southwestern Mali, Cote d'Ivoire, Togo, Benin, southern Niger, Cameroon, and central Ethiopia recorded heavy rainfall during late August and early September. Meteosat satellite imagery and incomplete surface meteorological reports both indicated heavy rainfall in parts of Nigeria and Sudan during the same period, which led to flooding as reported by the press. The situation in Sudan was exacerbated by downstream flooding that resulted from torrential downpours in the central Ethiopian highlands. Within the last two weeks, however, precipitation has generally diminished across much of the Sahel as the rainy season draws to a normal close in late September.

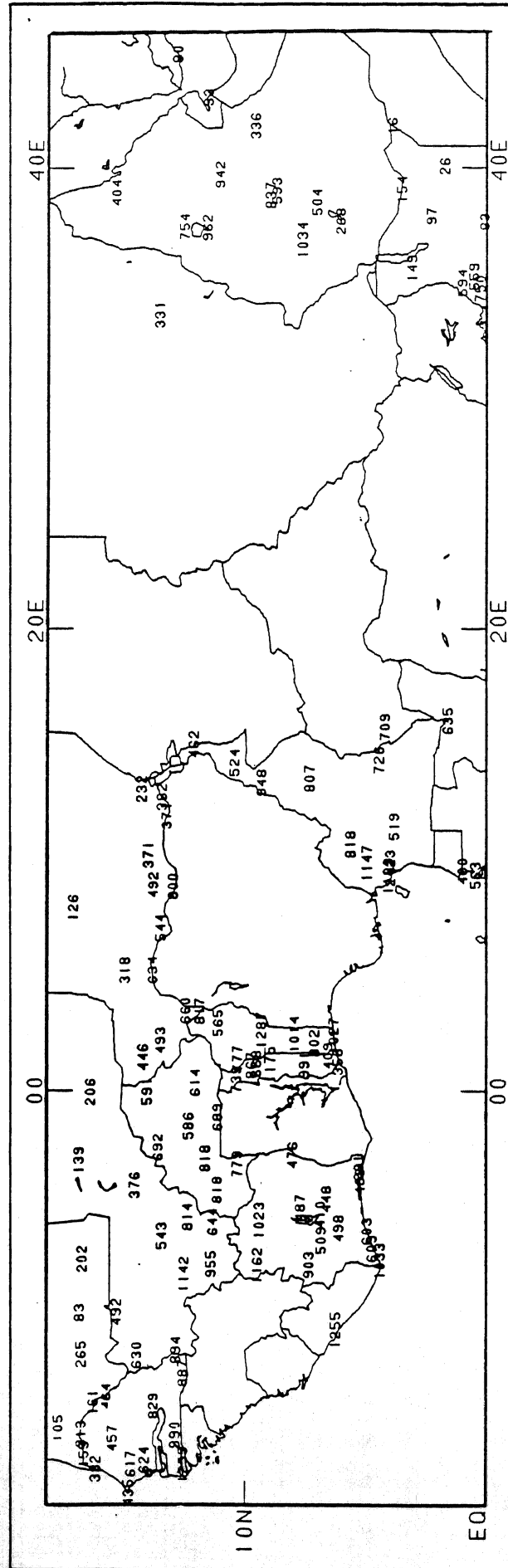


Figure 1. Total precipitation (mm) during June 1-September 30, 1988 (122 days). 109 or more days (90%) were required for a station to be included. In contrast to the unusual dryness of the past few decades, this year's precipitation was generally near to above normal. (Data incomplete in Nigeria, Chad, and most of Sudan.)

Seasonal rainfall amounts varied according to the latitude, with stations closest to the equator recording the largest amounts and the smallest totals occurring in the northernmost locations (see Figure 1). Overall, many stations in the Sahel reported near to above normal seasonal precipitation, a welcome change from several decades of generally below normal June-September precipitation (see Figure 2). After a slow start, much of Senegal and Gambia accumulated excess rainfall during the four month period. Farther east, near to above normal seasonal precipitation fell on most of southern Mali, Burkina Faso, Cote d'Ivoire, Togo, Benin, southern Niger, Ethiopia, and Djibouti. According to press reports, satellite imagery, and incomplete meteorological data, much of Nigeria, Chad, and Sudan also experienced near to above normal June-September precipitation. Abnormally dry conditions were limited to southeastern Mauritania, central Mali, southeastern Burkina Faso, and the northern portions of Togo and Benin.

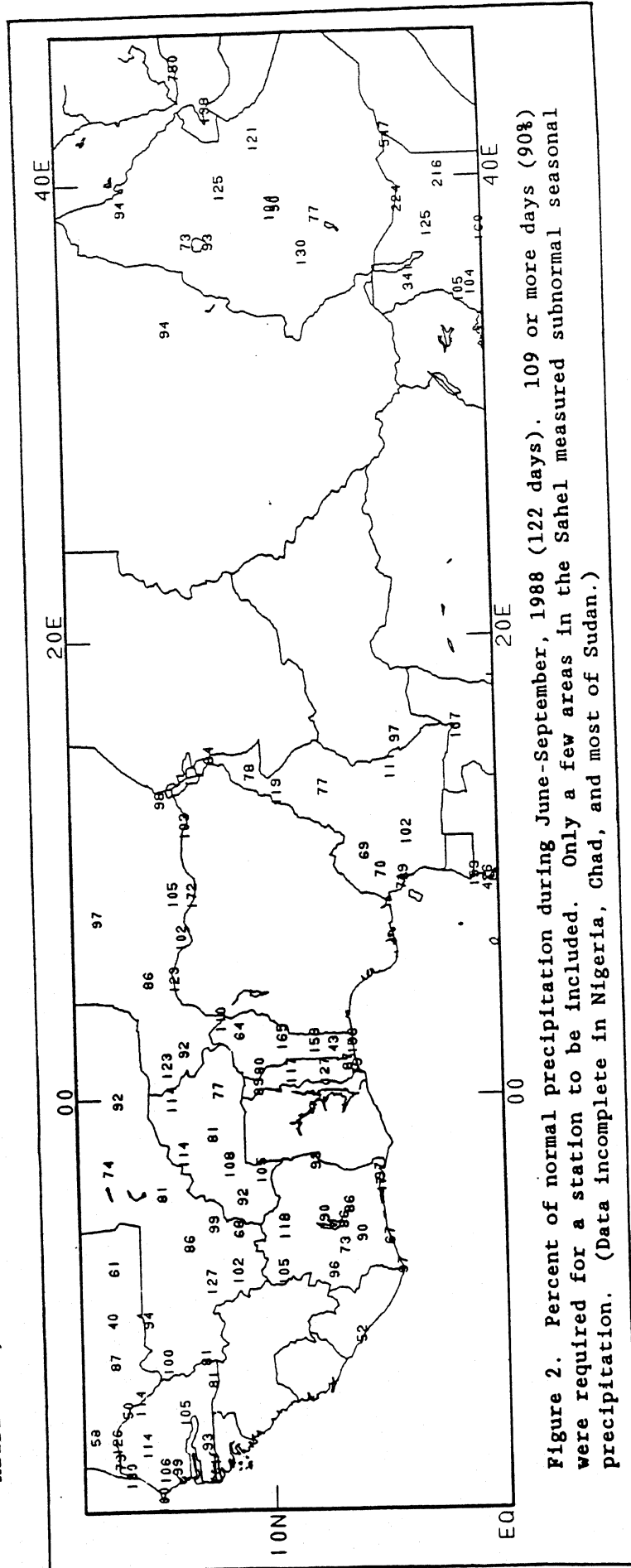


Figure 2. Percent of normal precipitation during June-September, 1988 (122 days). 109 or more days (90%) were required for a station to be included. Only a few areas in the Sahel measured subnormal seasonal precipitation. (Data incomplete in Nigeria, Chad, and most of Sudan.)

